Electronic Version
Stylesheet Version v1.1.1

Description

[GoosLock - A locking device for Gooseneck trailers]

Federal Research Statement

[0001] [No federal research funds were used to support the invention and/or development of this device]

Background of Invention

[0002] According to law enforcement agencies, many thousands of trailers are reported stolen each year. Most are unlocked and/or unprotected from theft. This invention is intended to prevent thefts-of-opportunity. The device is to be used by individuals, and by those in the agricultural, construction, and other industries where Gooseneck type trailers are used. It provides a theft deterrent for both unhooked trailers and trailers connected to vehicles.

Summary of Invention

[0003] The device disclosed and claimed restricts the movement of the lower latching plate of a gooseneck trailer coupler.

When properly installed and secured with an appropriate padlock, the device prevents the typical 2 5/16 inch, and on some types of couplers, a 2 inch, and 1 7/8 inch towing-balls from entering the gooseneck coupler, thus deterring theft of an un-hooked trailer. The device, when installed and on a coupler connected to a towing-ball on a tow vehicle prevents removal of a trailer connected to a vehicle.

[0004] []The device is simple, easy to install, inexpensive, and typically requires no modification to an existing gooseneck coupler. The device can be easily attached to the trailer coupler to prevent the device from being lost or misplaced.

Brief Description of Drawings

[0005] Figure 1 is a plan view of the device in a form used for two common couplers.

[0006] []Figure 2 is a plan view of a modified form of the device used for different types of couplers.

[0007] []Figure 3 is a top view of one of the most common gooseneck coupler types.

[0008] []Figure 4 is a bottom view of one of the most common gooseneck coupler types.

[0009] []Figure 5 shows the device installed from the front of one

of the most common gooseneck coupler types toward the back of the coupler, providing a locking opportunity at the rear of the coupler.

[0010] []Figure 6 shows the device installed from the back of one of the most common gooseneck coupler types toward the front of the coupler, providing a locking opportunity at the front of the coupler.

Detailed Description

[0011] As required, detailed embodiments of the device are disclosed. However, it is to be understood the device may be embodied in variations of the form provided in FIG 1and FIG 2 to accommodate variations in gooseneck coupler manufacturer designs, and the device may be constructed by using several hardened materials, including but not limited to, plate steel, cast iron, steel alloys, and wire rope. Therefore, specific functional details disclosed in this document are not to be interpreted as limiting, but merely show the basis for the claim and serve as a representation of the device.

[0012] []The device, FIG. 1 and FIG 2, is a locking component for gooseneck couplers, FIG. 3, such as those incorporated on most utility type trailers, including horse, stock, flatbed, job site, box, and others, which extend over the bed of a

tow vehicle and are lowered onto a towing-ball mounted on the vehicle. A gooseneck coupling device typically has two positions - one is open to allow the coupler to slide over a towing-ball, and the other is closed, FIG 4, to prevent the towing ball from being pulled from the coupler.

[0013] []Viewed from above, a typical gooseneck coupler contains two components - one is the fixed upper plate, 1-FIG 3, which includes a socket for a towing-ball, 2-FIG 3, and the other is a moveable, lower latching plate, 3-FIG 3. The latching plate is hinged to the fixed upper plate to allow horizontal movement of the latching plate. The latching plate is held into position at the front of the coupler by a short shaft which is welded to the lower latching plate and passes through a hole in the fixed upper plate, 4-FIG 3. The latching plate is held into position at the rear of the coupler by a metal band, 5-FIG 3. Both ends of the metal band are welded to the lower latching plate. The metal band is shaped to extend above and parallel to the fixed upper plate. The band, 5-FIG 3, and the upper plate, 1-FIG 3, contain holes, 6-FIG 3, which when aligned and a retainer pin is inserted, prevent the latching plate from moving.

[0014] []Viewed from below, a typical gooseneck coupler contains

a fixed upper plate, 6-FIG 4, a movable lower latching plate, 5-FIG 4, a hinged front, 4-FIG 4, and a socket or opening for a towing ball, 3-FIG 4. In a normally closed position, when the holes in the upper and lower plate are aligned, 1-FIG 4, the coupler opening will not allow a 2 5/16 inch towing-ball to be removed from the coupler, thus preventing the trailer from becoming un-hooked from the tow vehicle. The dimension shown in, 2-FIG 4, illustrate this condition, i.e. the dimension is less than 2 5/16 inches.

[0015] []The lower latching plate of most gooseneck couplers will travel past the point where the hole in the fixed upper plate and the hole in the lower latching plate are aligned. This past-closed-position is illustrated by 6-FIG 3. The device takes advantage of this condition. On many couplers the opening, 2-FIG 4, is small enough that it will not accommodate a 2 inch or a 1 7/8 inch towing-ball. On some couplers the opening will allow a 2 inch ball to be inserted into the opening; however, the problem is easily solved by first inserting a 2 7/16 inch ball into the coupler prior to installing the device.

[0016] []The device is designed to be inserted into the opening between the fixed upper plate and the horizontal band of

the lower latching plate, 7-FIG 3. The lower latching plate must be moved as far as it will travel in the past-closed-position, as illustrated by the misaligned holes in 6-FIG 3. When the device is inserted, as shown in 7-FIG 5 and 7-FIG 6, movement of the lower latching plate is restricted. The device must be secured in place. This is accomplished by the design of the device and by use of a padlock inserted through one of the holes provided in the device, 8-FIG 5, 8-FIG 6, 3-FIG 1, and 3-FIG 2. The hole closest to the coupler, which provides a clear path for the lock shackle, is to be used. When the device is secured in place, the coupler opening is too small to allow a standard towing-ball to be inserted into or removed from the coupler, thus preventing the trailer from being connected to a tow vehicle equipped with a standard towing-ball, or being removed from a tow vehicle to which it is connected, without first removing the device and opening the coupler to a normally-opened position.

[0017] []The device as illustrated in FIG 1 and FIG 2, is a single piece of steel. It may be cut from plate steel using standard metal cutting techniques. The steel should be of sufficient hardness and thickness to resist attempts to defeat the device. The device is designed with a tapered shaft,

1-FIG 1 and 1-FIG 2, of appropriate dimensions and sufficient length, width, and thickness to allow it to pass through the opening between the fixed upper plate and the horizontal band of the lower latching plate, 7-FIG 3. The device is designed with a block end, 2-FIG 1 and 2-FIG 2, which limits the distance the device will travel when inserted through the opening in the coupler. When the device is inserted fully into the opening, until the block end of the device contacts the coupler, the length of the tapered shaft of the device must be sufficient to extend past the edge of the coupler and provide a method to lock the device in place. A hole, 3-FIG 1 and 3-FIG 2, which is large enough to accommodate a typical padlock shackle, must be created in the end of the tapered shaft. The hole(s) must be placed along the shaft to provide a clear path for the padlock shackle, but close enough to the coupler to prevent the device from sliding back and forth in the opening, 8-FIG 5 and 8-FIG 6. The width of the tapered shaft of the device, 4-FIG 1 and 4-FIG 2, must be sufficient to prevent excessive movement of the lower latching plate while accommodating the less-than-perfect tolerances of common gooseneck couplers. The thickness of the device, 5-FIG 1 and 5-FIG 2, must be sufficient to

prevent the device from being forced into a position other than that of the design. The block end of the device must be of sufficient size to prevent it from passing through the opening as illustrated in, 7-FIG 5, and in FIG 6.